

## ABSTRACT

A client is permitted to send data access commands directly to network data storage of a network file server after obtaining a lock on at least a portion of the file and obtaining metadata indicating storage locations for the data in the data storage. For example, the client sends to the file server at least one request for access to a file. In response, the file server grants a lock to the client, and returns to the client metadata of the file including information specifying data storage locations in the network data storage for storing data of the file. The client receives the metadata, and uses the metadata to produce at least one data access command for accessing the data storage locations in the network storage. The client sends the data access command to the network data storage to read or write data to the file. For a write operation, the client may modify the metadata. When the client is finished writing to the file, the client returns any modified metadata to the file server.